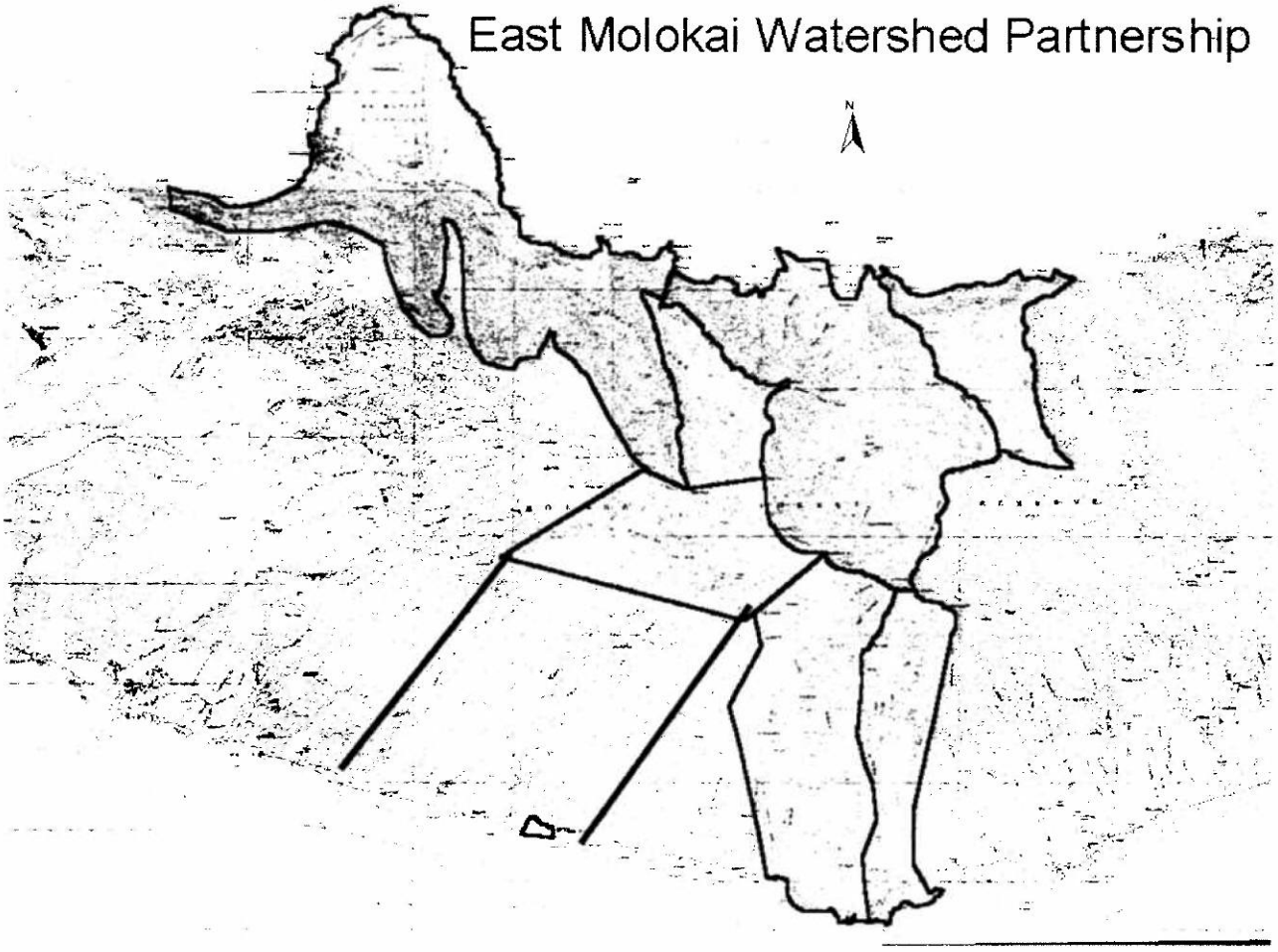
East Molokai Watershed Partnership Strategic Plan

For the South Slope

(FY1998 – FY2003 Summary, FY2004 – FY2009 Projections)



Produced By

The Nature Conservancy of Hawaii

Molokai Office

And The East Molokai Watershed Partnership

Introduction

The East Molokai Watershed Partnership Strategic Plan summarizes activities over the south slope of East Molokai, from Fiscal Years 1998-2003, and projects activities for Fiscal Years 2004-2009.

Background

During Fiscal Year 1998, The Nature Conservancy (TNC) participated in an island-wide grassroots community strategic planning process to submit an application to the USDA Empowerment Zone Program. The Conservancy proposed,The Kamalo/Kapualei Watershed Project which became a priority project of the more than 40 projects of a strategic plan that became part of the Molokai Rural Empowerment Zone Application (Attachment 1).

In November 1999, The East Molokai Watershed Partnership (EMoWP) was formalized through the signing of the EMoWP Memorandum Of Understanding (Attachment 2). The fourteen partners including, landowners, conservation agencies and grantors pooled their support and resources necessary for this significant community, south slope watershed project called the, "Kamalo/Kapualei Watershed Project (KKWP). The three main land-based partners that occur on the south slope are Kamakou Preserve of The Nature Conservancy (TNC), Kamalo of Kamehameha Schools (KS) and Kapualei of Kapualei Ranch (KR).

In January 1999, The Molokai Rural Empowerment Zone Application won an Enterprise Community designation ("EC"), and a local board (Ke Aupuni Lokahi) was formed to carry out the 10-Year Strategic Plan. Ke Aupuni Lokahi unanimously approved $100,000 of "EC" funds for the Kamalo/Kapualei Watershed Project. Accomplishments and benchmarks of KKWP are described in further detail in the Summary Section.

Kawela Plantation, the single largest land holding, became a formal partner of EMoWP in April 2003. Additionally, a signed license agreement between Kawela Plantation Homeowner's Association (KPHA) and The Nature Conservancy will facilitate actions by TNC as the manager of KPHA "Common Lands".

Project Area Description

Kamalo is dominated by a steep canyon, 1500 feet deep and over half a mile wide at its head. The canyon is the most striking feature of East Molokai's ruggedly beautiful southern slopes. The incredible topography of the canyon and the stream-cut upper slopes that feed into it limits human access to the region. In the 1500 years human have been on Molokai, probably only a few dozen people have explored the lands above Kamalo's famous waterfalls--Hina, Haha and Mo`oloa. Kamalo is owned by Kamehemeha Schools Bishop Estate.

Kapualei is comprised of a series of steep gulches/ridges east of Kamalo Canyon. The steep ridges culminate at the highest peak on Molokai, Kamakou (4974'). Like Kamalo, the upper reaches of Kapualei have remained relatively unexplored. The Kapualei Ranch, Austin Estate, owns Kapualei.

Together, the two *ahupua'a* (land division) encompass about 5,000 acres. The "upper zone", above 3,500' elevation (about 1,500 acres), contain the heart of some of the best remaining lush, **intact** native Hawaiian forest that once covered the entire mountains of East Molokai and are home to hundreds of *endemic* Hawaiian plant and animal species.

Kawela Plantation's "Common lands" is the single largest parcel (5,500 acres) of the EMoWP. At one time, the Molokai Ranch owned about 90% of the Kawela ahupua'a. Today, the Ranch retains title only to the upper portions, which is now The Nature Conservancy's **Kamakou Preserve** through a perpetual conservation easement. The Kawela Ahupua'a has very similar natural community types as that of Kamalo and Kapualei. However, the terrain does not contain as many steep gulches. The US Fish & Wildlife Refuge Kakahaia Pond (Wetland) is located at the coast.

In ancient times, Kawela was once a thriving village. With the rich near shore reefs, and abundant springs, Kawela was able to support an entire community, from royalty to commoners. Molokai's main city of refuge is located at Kawela. Catherine Summers' "Molokai, A Site Survey" points out that there were several "inland ponds" (Uluanui, Kawi'u) that were similar to Kakahaia Pond, a freshwater wetland, in the Kawela/Makakupaia Ahupua'a. Only Kakaha'ia has not been totally filled in with sediment.

In 1981, Hawaii State Senator Wadsworth Yee, developed the 5,930 acre Kawela Plantation using the "ahupua'a" model, with 210, 2 acre agricultural lots in the lower elevation of the property, and the upper 5,500 acre "common" lands. Each owner enjoys access to the "common lands" which are used primarily for hunting and hiking. Approximately sixty homes have been built so far. A private water system with 5 wells serves the Plantation.

Kamakou Preserve was establish by The Nature Conservancy to protect intact examples of native Hawaiian vegetation types like montane wet forest, Mesic forest and mesic shrublands. Special unique vegetation type also include the Pepeopae and Puu Alii montane bogs.

The native shrublands that extend from Kamalo to Kamakou are considered some of the best remaining native Hawaiian Shrublands in the State. These shrublands are home to hundreds of *endemic* Hawaiian plant and animal species.

Degradation of the Landscape

The upper elevation rain forest generally above 3,500 feet elevation remains in relatively good shape as animals (mainly pigs) and alien plants have simply not established themselves yet. In those areas where animals and alien plants are established, efforts are ongoing to reduced the threat of that these species pose.

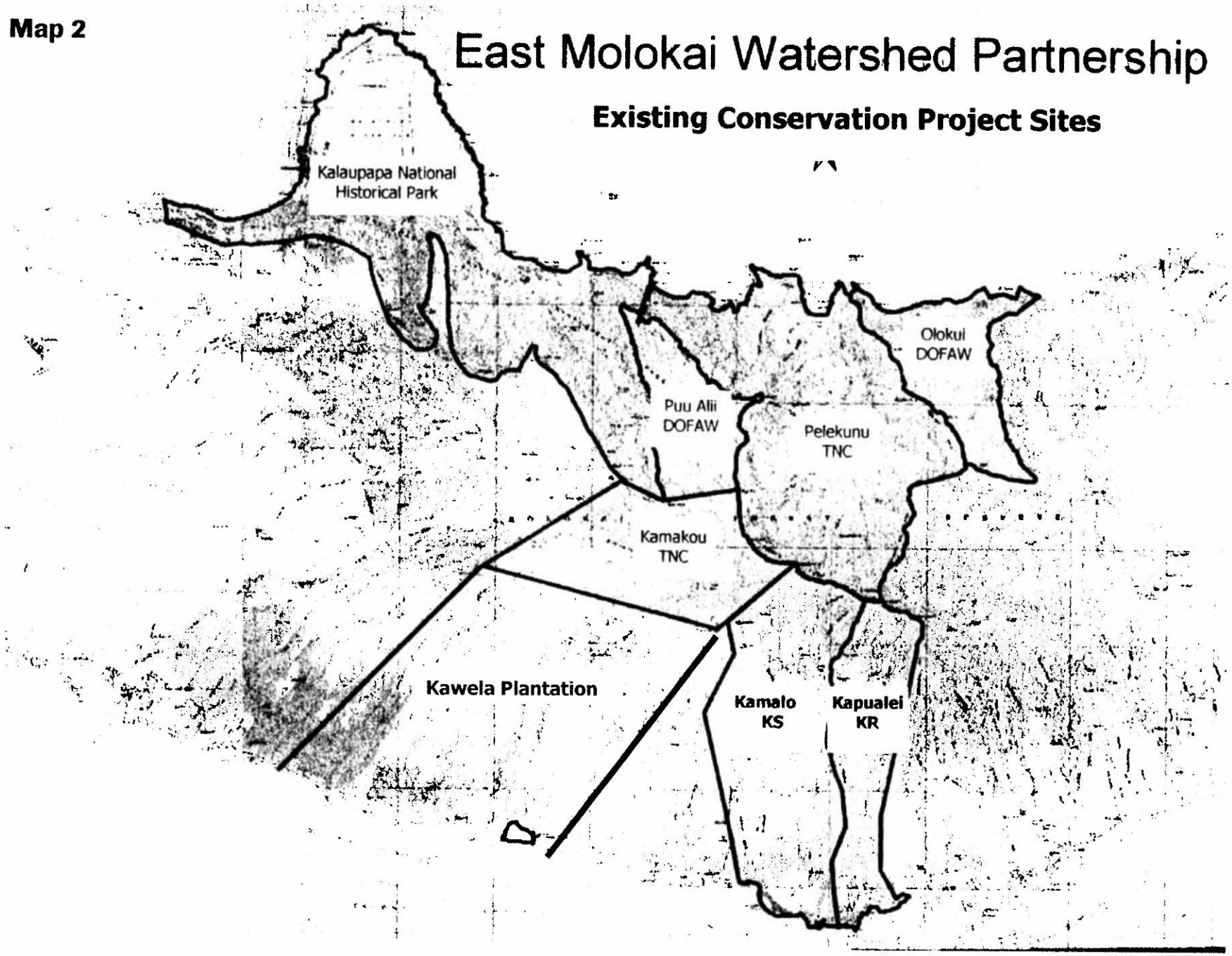
Feral animals have proven to be the main carriers, soil preparers, fertilizers and scarifiers of and for weed seeds. Pigs impact the understory (low growing plant ground cover) of the forest which diminishes the water carrying capacity and also give alien plants a chance to become established in open soils of this area. Goats are the primary reason for the degradation of the

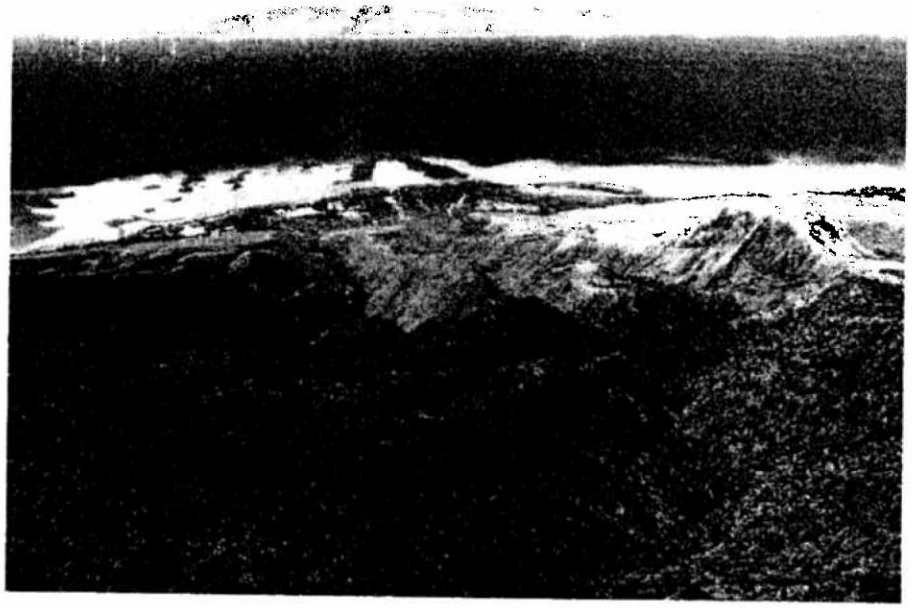
rugged *"middle zone"* (100' - 3,500' elevation). Goats roam in large numbers forest area which diminishes the water carrying capacity and allows non-native weeds a, free from natural predators and safe on the steep terrain, from hunters. These animals have pushed back the native forest and shrubland cover nearly 2 miles to about 3,500 feet in elevation, where a "browse line" is quite evident. The areas just below the browse line are denuded grass land with many dead tree stumps, remains of a dying forest. The last wild cattle were removed from these areas in 1972-73. Axis deer prefer the low elevation kiawe forest, but will move to upper elevation areas if pressured from below.

Fire is also a major threat of the middle zones. Fires in 1988, 1991, and 1998 consumed more than 10,000 acres each, and resulted in increase sedimentation during the following winter rains. Fire also displaces native vegetation, as fire-adapted non-native vegetations quickly takes over burned areas. Molasses grass is a good example of a non-native grass that is fire adapted and recovers quickly after a fire. Molasses grass in effect reclaims the nutrients from the burned areas, and quickly turns this disturbance into a sea of grass, that is more vulnerable to repeat fires and blankets out native regeneration.

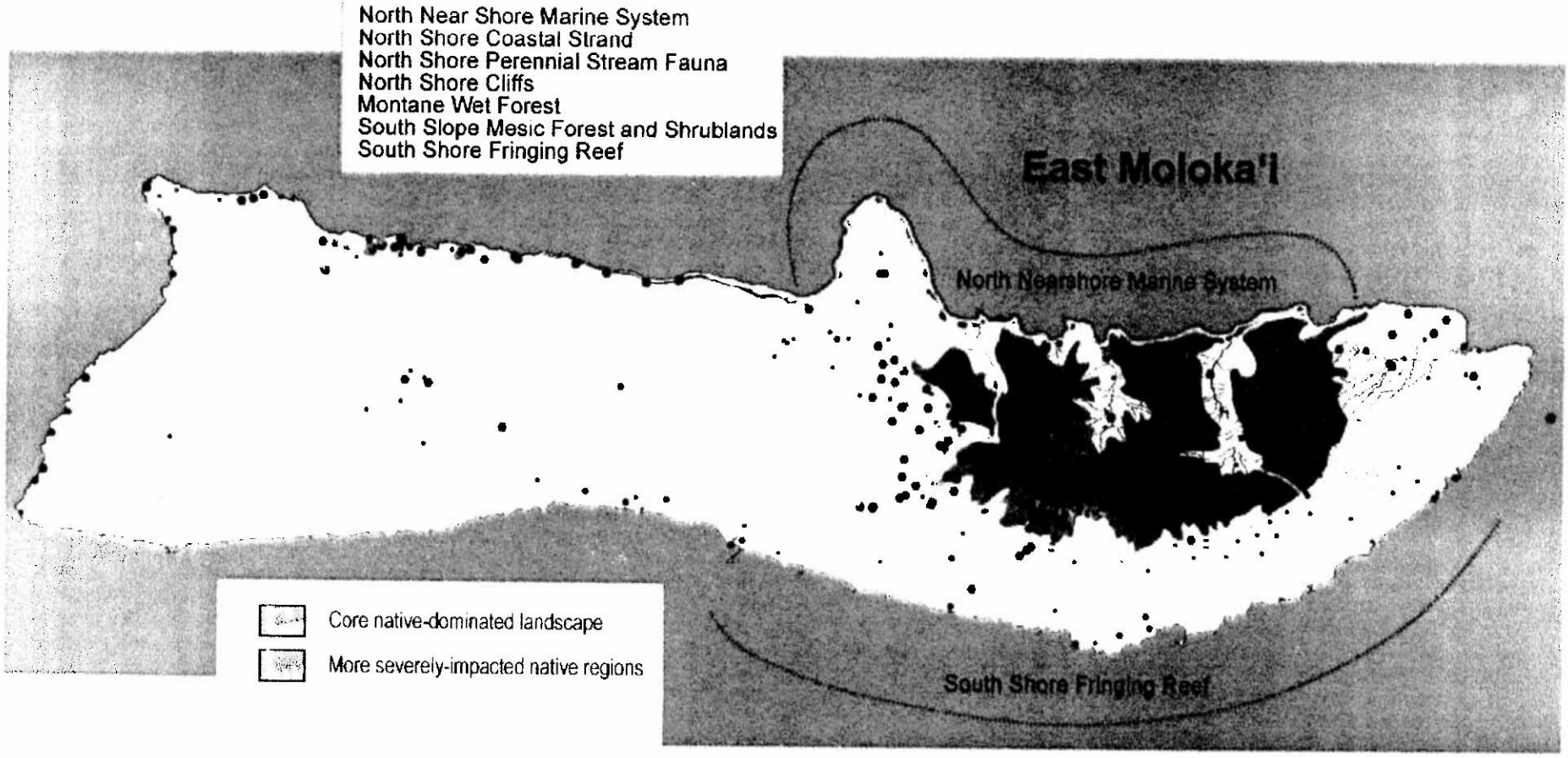
To maintain and/or increase the watershed capacity, it is essential to keep the upper zone free of animal intrusion, and fires to reduce erosion of the middle zone. Increased vegetation will increase the moisture retention, which directly benefit the landowners and tenants of these *ahupua'a* by having water available for cultural and economic activities, while reducing sedimentation that impact the coastal flood plains, fishponds, and near-shore reefs.

Map 2


East Molokai Watershed Partnership
Existing Conservation Project Sites
Kalaupapa National Historical Park
Olokui DOFAW
Puu Alii DOFAW
Pelekunu TNC
Kamakou TNC
Kawela Plantation
Kamalo KS
Kapualei KR



Conservation Sites and Targets: Island of Moloka'i



II. Summary of EMoWP Activities

There are several important benchmarks of the EMoWP that is key to the future success of conservation projections (Section III) for the south slope of East Molokai. First, was the formation of the East Molokai Watershed Partnership between conservation partners, major landowners, funding agencies, and the Molokai community (See **attached** EMoWP MOU). Second, was the Kamalo/Kapualei Watershed project which demonstrated and put into actions many of the projections for the future. Third, the development of key monitoring systems to measure the changes of these areas as management is implemented on the ground. In this section are listed some of the accomplishments of the **Kamalo/Kapualei Watershed Project KKWP and other EMoWP accomplishments**.

FY 1999

Kamalo/Kapualei Watershed Proposal (attached) completed and EMoWP formed.

FY 2001

The Kamalo Kapualei 5.5 mile contour fence completed. A fence crew of six completed this project in six months (October 2000 to March 2001).

The 1st goat survey of the Kamalo/Kapualei landscape was completed and approximately 1,300 goats was counted.

Helicopter assisted hunts was initiated at Kamalo and through the involvement of local volunteer hunters.

Vegetation and Erosion monitoring systems developed and installed.

FY 2002

The 2nd Kamalo/Kapualei goat survey completed and approximately 1,400 goats was counted.

Helicopter Assisted Hunts have accounted for more than 400 goats with 75% retrieval rate.

A new trapping method trial is being conducted in Kamakou Preserve. This method uses a trap door and macadamia nuts as bait.

Kamalo Conservation Advisory Council formed to help facilitate participation between the Molokai Community and the KKWP.

FY 2003

Kapualei Ranch signs a License Agreement with TNC and DLNR to conduct Aerial shooting in the steep unsafe sections of their land. To date over 800 goats have been eliminated.

Kawela Plantations joins EMoWP and additionally, signs an Memorandum of Agreement with TNC to manage their "common lands". KP is the largest single private track on East Molokai South Slope at 5,500 acres.

March and June EPA Land-based Pollutants on Coral Reefs Workshops ranks South Slope of Molokai as one of the top Priority Areas. Preliminary plans are to fund programs to increases the work that has been established at KKWP further west to include Kawela.

To date, the Kamakou Preserve macadamia baited traps has captured 21 pigs, all alive and were distributed to the community for home use. They range is size from 10 pounds piglets to a 200 plus pound boar.

FY 2004

Fiscal Year 2004 began with great anticipation. However, due to the Kawela/Makolelau fence delays and the lack of aerial shooting, the EMoWP goat reduction goals have not reach expected results. Completing the Kawela/Makolelau fence and resuming aerial shooting of goats will be major goals for FY2005. Helicopter assisted hunts accounted for 153 goats removed. Kamakou pig traps captured a total of 22 pigs for the year. The newly installed Kamalo pig transects 15 and 16 were surveyed March 19 and had high levels of activity (48%).

Puu Haha and Hina gulch are now completely fenced. The Hina portion applied a new technology "slinky" type fence.

TNC is working with the Kawela Plantation Homeowner's association to begin goat reduction using resident volunteers similar to the Kamalo Helicopter assisted hunts. It is important to begin this program after the fence project is completed.

The partnership has just received confirmation of being funded through USFWS HCCI grant program. The funds will be used to improve the Kawela Plantation's common lands dirt roads for hunter access and to provide fire infrastructure. This project will commence in the spring of FY05.

A public hearing on the Conservation District Use Application for the Kawela/Makolelau Fence was held on March 11, at the Mitchell Pauole Center on Molokai. About a dozen community members testified in favor of the fence project. Only one testified against project and later filed a petition for a contested-case hearing with the Land Board. The petition listed 9 specific grievances. At its June meeting, the Board asked the filing party it would consider speaking with the interested parties to see if something can be worked out prior to the initiation of a contested case hearing. The filing party agreed and would meet with interested parties to see if its issues could be resolved. If after 45 days a resolution is not achieved, the Board stipulated that the contested case will move forward. At this point the interested parties have met and are in the 45 day period. The fence project has been put on hold pending the outcome of the resolution and/or contested case hearing.

TNC hosted ACETA Aerial Shooting Training for DoFAW on November 19-21. Seven DoFAW staff completed training. TNC, NPS and Wildlife Services also attended the training.

Kamalo Stream Field trip conducted December 3rd, with Guy Hughes (Kalaupapa NHP), Glynnis Nakai (USFWS), Pat Chavez (USGS-Mapping), Gordon Tribbler (USGS—Water), Jim Jacobi (USGS BRD), and David A. Helweg (USGS-Deputy Center Director, Pacific Island Ecosystems Research Center) to determine stream monitoring needs for the region. Preliminary Molokai Stream Flow Strategic Plan drafted the next day with USGS in the lead. The Partnership also anticipates the installation of two USGS stream gauge, one at Kamalo and one at Kawela streams. Along with the gauge installation, USGS will begin to map the associated watershed vegetation and landscape.

TNC assisted the State with the Molokai bird surveys. Preliminary work included help locate original USFWS transects and flag prior to the surveys which occured on March 31-April 2. Survey was successful as weather cooperated. Great news—3 iiwi were detected and recorded!

FY 2005

Four helicopter assisted hunts in the Kamalo and Three in Kawela resulted in 186 goats removed. Three pig hunts in the Kamalo area netted a total of 3 pigs. Kamakou pig traps captured a total of 21 pigs for the year.

In FY04, the traps consistently had multiple pig captures and totaled 38 pig captures for that year. In FY05, the number of captures significantly decreased by the end of the year. The 1st quarter of FY05 netted 16 pigs, the 2nd quarter netted 4 pigs, the 3rd quarter netted 1 pig, while the 4th quarter netted 0 pigs.

The pig trapping at Kamakou Preserve is coinciding with activity levels of 10% or less. This may be a good indicator that the overall pig population has been reduced significantly as a result of the trapping effort. The 10% is a threshold level agreed upon by the Molokai Hunting Working Group for determining the success of ungulate control efforts.

The USFWS HCCI grant was awarded to TNC to improve the Kawela "common ground" hunting roads. The project started on April 4 and was just completed on June 24. The project is important in providing access through out the Kawela property for hunting and animal control work. Approximately 11 miles of dirt roads were improved. The Kawela fence project will also benefit from the improved road access. Unit III road was cut a little wider as it is an important "fire break" road that was used in the past. The EMoWP will now expand the Kawela helicopter assisted hunts to include vehicle ground hunters.

A Miconia helicopter survey was conducted from June 27-29 at Puu O Hoku Ranch east of the EMoWP areas. No Miconia was detected, although established populations of Clidemia and Tibouchina were detected

A four-day blackberry control trip was conducted 2/28 thru 3/2. Approximately 17 acres were surveyed and 70% of the known population (13 acres) was treated.

III. EMoWP Projections

A. Feral Animal Control consists of Fencing, Hunting, Live Trapping and Aerial Shooting. Fencing is used to prevent the intrusion of feral animals into native vegetation areas. The 5.5 mile Kamalo/Kapualei contour fence completed in 2001, prevents the intrusion of feral goats into the native shrubland, mesic and wet forest of the upper elevations. The EMoWP projects the extension of this fence into Kawela and will join up with the Kamakou Preserve east boundary fence. A possible second fence will be assessed which would connect the Puu Alii fence to the Kamalo/Kapualei/Kawela contour fence. Once the fences are built, they are surveyed and repaired as needed to maintain the integrity of the fence.

Hunting is mainly done by involving the local hunting community. Each land owner will conduct their own "public hunting" programs. The EMoWP will run organized helicopter assisted hunts. Hunters that are involved with the helicopter assisted hunts will be required to be trained in helicopter safety and wear all the required safety gear during the hunts. The local hunters are recruited by "hunt leaders" who have been trained and are chosen by TNC because of their previous experience in this program. Retrieval of feral animal carcasses for home use is a key goal of this program. The helicopter is very effective in retrieval of the goats using a long line in the middle eroded areas. In the upper forest, key helipad landing sites and reference trails will be established that allow pig hunters to access remote areas.

Live Trapping has proven marginally successful for feral pigs in the Kamakou Preserve. Feral pigs are lured into a metal cage using bait. Once a pig enters the trap and begins eating the bait, a trigger is hidden in the bait which releases the gate to be closed. The one-way gate can also be pushed open to allow more pigs enter the trap. Live trapping will augment the control of pigs in the upper forest areas.

Aerial Shooting will occur only in the steep canyons that is extremely unsafe to hunt. The goat carcasses will not be retrieved due to the unsafe, rugged, steep terrain. The State Division of Forestry and Wildlife, an EMoWP partner, will provide the shooter for this effective mission.

B. Weed Control consist of identifying and strategizing the removal of key weed species. As an example, a blackberry patch (Rubus argutus) was sited in the wet forest of Kamalo. A subsequent survey revealed the core and extant of this infestation. A key strategy for the control of this weed is to create a "line of death" and prevent this weed from moving further up into the pristine forest and to eradicate this population if possible.

C. Fire Management is critical for the south slope and past fires have demonstrated it devastating effects. The EMoWP will focus its effort on developing better infrastructure

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C. Fire Management is critical for the south slope and past fires have demonstrated it devastating effects. The EMoWP will focus its effort on developing better infrastructure

that will aid fire authorities during suppression effort. A fire tasks force is also needed to involve the community in the planning of suppression strategies.

D. Sedimentation Ponds are needed to capture sedimentation loads during the wet winter season. Sedimentation ponds have proven successful in other part of Hawaii, most notably along the south and west coasts of West Maui.

E. Monitoring programs will result in several things. First, monitoring at the onset of a project will record the state of an area, which can be compared in the future to help managers objectively rate the success of their programs. Monitoring programs will be set up to measure vegetation recovery, feral animal removal, sedimentation rates, and climatic trends.

2004—2009 Budget Projections

Extend the Kamalo/Kapualei contour fence along the Kawela contour and then up to the end of the Kamakou East Boundary Fence.	May—August 2005	$200,000
Maintain/improve completed fences	$40,000 annual	$200,000
Conduct aerial shooting to reduce goat numbers by 2,500 every 2 years	$30,000 annually	$150,000
Conduct Helicopter Assisted hunts to reduce goat numbers by 500 annually	$30,000 annual	$150,000
Conduct monitoring programs – feral animal surveys, vegetation, weather data, etc.	Annual $5000	$25,000
Conduct helicopter assisted hunts to reduce pig activity to less than 10% above the fence.	10,000 annually	$50,000
Maintain Pig trap and bait program in upper areas	$5,000 annually	$25,000
Conduct Weed Control Tasks	$24,000 annually	$120,000

Formation of Fire Task Force	By 2005	0
Install improve fire infrastructure in key south slope areas	By end of 2005	$50,000
Maintain fire infrastructure every years	$25,000 years 2 & 4	$50,000
Design and choose site for Sedimentation Ponds	By end of 2004	$50,000
Construct 4 Sedimentation Ponds	$500,000 per pond	$2,000,000
Develop monitoring to measure changes in near shore sedimentation rates	Annually $5,000	$50,000
Complete 5 mile fence from Hanalilolilo to Kawela.	May-October 2008	$300,000
Administrative Cost		$180,000
Total 5 year Costs		$3,600,000.00

East Molokai Watershed Partnership Funders
FY2000 (July 1999) – FY2005 (June 2005)

FY 2000 (July 1999 – June 2000)

State Kamakou NAPP Fund	$141,569.00
Maui County Office of Economic Dev.	$6,185.00
The Nature Conservancy NAPP Match (Private Contributions)	$70,784.00
The Nature Conservancy Forest Campaign (Private Contributions)	$24,863.00
	$243,401.00

FY 2001 (July 2000 – June 2001)

State Kamakou NAPP (NARS Fund)	$138,791.00
Maui County Board of Water Supply	$12,500.00
Maui County Office of Economic Dev.	$43,815.00
USDA Enterprise Community	$68,691.00
USFWS Partners Program	$38,303.00
NRCS WHIP	$50,000.00
Maui County Board of Water Supply	$12,441.00
The Nature Conservancy NAPP Match (Private Contributions)	$63,395.00
The Nature Conservancy Forest Campaign (Private Contributions)	$17,370.00
	$445,306.00

FY 2002 (July 2001 – June 2002)

State Kamakou NAPP (NARS Fund)	$139,179.00
Maui County Board of Water Supply	$11,872.00
USDA Enterprise Community	$918.00
USFWS Partners Program	$11,697.00
State NARS Watershed Fund	$9,249.00
The Nature Conservancy NAPP Match (Private Contributions)	$69,589.00
The Nature Conservancy Forest Campaign (Private Contributions)	$23,992.00
	$266,496.00

FY 2003 (July 2002 – June 2003)

State Kamakou NAPP (NARS Fund)	$144,453.00
Maui County Board of Water Supply	$8,128.00
Maui County Dept. of Public Works	$17,871.00
USDA Enterprise Community	$11,397.00
Maui County Office of Economic Development	$10,000.00
State NARS Watershed Fund (administered by DLNR)	$30,000.00
The Nature Conservancy NAPP Match (Private Contributions)	$72,227.00
The Nature Conservancy Forest Campaign (Private Contributions)	$61,611.00
	$355,687.00

FY 2004 (July 2003 – June 2004)

State Kamakou NAPP (NARS Fund)	$130,000.00
Maui County Board of Water Supply (FY03 & 04 contracts)	$50,000.00
Maui County Dept. of Public Works	$66,000.00
Maui County Dept of Public Works	$54,129.00
USDA Enterprise Community	$18,994.00
State NARS Watershed Fund	$20,000.00
USFWS Partners Program	$50,000.00
Kamehameha Schools	$30,000.00
The Nature Conservancy NAPP Match (Private Contributions)	$65,000.00
The Nature Conservancy Forest Campaign (Private Contributions)	$60,000.00
	$544,123.00

FY 2005 (July 2004 – June 2005)

State Kamakou NAPP (NARS Fund)	$130,000.00
Maui County Board of Water Supply	$25,000.00
Maui County Dept. of Public Works	$66,000.00
State NARS Watershed Fund	$20,000.00
USFWS Partners Program	$25,000.00
Kamehameha Schools	$30,000.00
The Nature Conservancy NAPP Match (Private Contributions)	$65,000.00
The Nature Conservancy Forest Campaign (Private Contributions)	$100,000.00
	$461,000.00